



SEQUENCE LISTING

RECEIVED  
SEP 04 2002  
TECH CENTER 1600/2900

<110> Hotten, Gertrud

Neidhardt, Helge

Paulista, Michael

<120> NEW GROWTH/DIFFERENTIATING FACTOR OF TGF- $\beta$  Family

<130> 100564-09022

<140> US 09/386,450

<141> 1999-08-31

<150> US 08/288,508

<151> 1994-08-10

<150> DE P 43 26 829.3

<151> 1993-08-10

<150> DE P 44 18 222.8

<151> 1994-05-25

<150> DE P 44 20 157.5

<151> 1994-06-09

<160> 41

<170> PatentIn version 3.0

<210> 1

<211> 2703

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(2703)

<223> coding region and non-translated regions for TGF-beta protein MP-52

<400> 1

ccatggcctc gaaagggcag cggtgatttt ttccacataa atatacgcga cttaaagag 60  
tttagacagc atgacatcag agagtaatta aattggttg ggttgaatt ccgtttccaa 120  
ttcctgagtt caggtttgta aaagatttt ctgagcacct gcaggcctgt gagtgtgtgt 180  
gtgtgtgtgt gtgtgtgtgt gtgtgtgtga agtattttca ctggaaagga tcaaaaacta 240  
gggggaaaaa aaaactggag cacacaggca gcattacgcc attcttcctt ctggaaaaa 300  
tcctcagcc ttatacaagc ctcttcaag ccctcagtc gttgtgcagg agaaaggggg 360  
cggttggtt tctccttca agaacgagtt atttcagct gctgactgga gacggtgcac 420  
gtctggatac gagagcattt ccactatggg actggataca aacacacacc cggcagactt 480  
caagagtcac agactgagga gaaagccttt ccttctgctg ctactgctgc tgccgctgct 540  
ttgaaagtc cactccttc atggttttc ctgccaaacc agaggcacct ttgctgctgc 600  
cgctgttc tttggtgta ttcagcggct ggccagagga tgagactccc caaactcctc 660  
actttctgc tttgtacct ggcttggctg gacctggaat tcactgcac tgttgggt 720  
gccccgact tgggccagag accccagggg accaggccag gattggccaa agcagaggcc 780  
aaggagaggc cccccctggc ccggaacgtc ttcaggccag ggggtcacag ctatggtggg 840  
ggggccacca atgccaatgc cagggcaaag ggaggcaccg ggcagacagg aggcctgaca 900

cagccaaga aggatgaacc caaaaagctg cccccagac cgggcggccc tgaaccaag 960  
ccaggacacc ctcccaaac aaggcaggct acagcccga ctgtgacccc aaaaggacag 1020  
ctccccgag gcaaggcacc cccaaaagca ggatctgtcc ccagctcctt cctgctgaag 1080  
aaggccaggg agcccgggcc cccacgagag cccaaggagc cgttcgccc acccccatc 1140  
acacccaag agtacatgct ctgctgtac aggacgtgt ccgatgtga cagaaaggga 1200  
ggcaacagca gctgaagtt ggaggctggc ctggccaaca ccatcaccag cttattgac 1260  
aaagggaag atgaccgagg tccgtggtc aggaagcaga ggtacgtgt tgacattagt 1320  
gccttgaga aggatgggt gctgggggccc gagctgcga tctgcgga gaagccctcg 1380  
gacacggcca agccagcggc ccccgaggc gggcgggctg ccagctgaa gctgtccagc 1440  
tgcccagcg gccggcagcc ggcctcttg ctggatgtc gctccgtgcc aggcctggac 1500  
ggatctggct gggagggtgt cgacatctg aagctctcc gaaacttta gaactcgcc 1560  
cagctgtgcc tggagctga ggcctggga cggggcaggg ccgtggacct ccgtggcctg 1620  
ggcttcgacc gcgcgcccc gcaggtccac gagaaggccc tgtcctggt gtttgccgc 1680  
accaagaaac gggacctgt tttaatgag attaaggccc gctctggcca ggacgataag 1740  
accgtgtatg agtacctgt cagccagcgg cgaaaacggc gggccccact ggccactcgc 1800  
cagggaagc gaccagcaa gaacctaaag gctcgtgca gtcggaaggc actgcatgtc 1860  
aactcaagg acatgggctg ggacgactgg atcatgcac cccttgagta cgaggcttc 1920  
cactgcgagg ggctgtcga gtcccatg cgctcccacc tggagccac gaatcatgca 1980  
gtcatccaga ccctgatgaa ctccatggac cccgagtcca caccaccac ctgctgtgtg 2040

cccacgcggc tgagtcccat cagcatccic ttcattgact ctgccaacaa cgtgggtgtat 2100  
aagcagtatg aggacatggt cgtggagtcg tgtggctgca ggtagcagca ctggccctct 2160  
gtcttcctgg gtggcacatc ccaagagccc ctctctgcac tcctggaatc acagaggggt 2220  
caggaagctg tggcaggagc atctacacag ctgggtgaa aggggattcc aataagcttg 2280  
ctcgtctct gagtgtgact tgggctaaag gcccccttt atccacaagt tcccctggct 2340  
gaggattgct gcccgtctgc tgatgtgacc agtggcaggc acaggccag ggagacagac 2400  
tctgaatggg actgagtccc aggaacagt gcttccgat gagactcagc ccaccatttc 2460  
tctcacctg ggccttctca gcctctggac tctcctaagc acctctcagg agagccacag 2520  
gtgccactgc ctctcaaat cacattgtg cctgtgact tctgtccct gggacagtg 2580  
agaagctgac tgggcaagag tgggagagaa gaggagaggg ctggataga gttgaggagt 2640  
gtgaggctgt tagactgtta gatttaaatg tatattgatg agataaaaag caaaactgtg 2700

cct

2703

<210> 2

<211> 501

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(501)

<223> TGF-beta protein MP-52 precursor

<400> 2

Met Arg Leu Pro Lys Leu Leu Thr Phe Leu Leu Trp Tyr Leu Ala Trp  
1 5 10 15

Leu Asp Leu Glu Phe Ile Cys Thr Val Leu Gly Ala Pro Asp Leu Gly  
20 25 30

Gln Arg Pro Gln Gly Thr Arg Pro Gly Leu Ala Lys Ala Glu Ala Lys  
35 40 45

Glu Arg Pro Pro Leu Ala Arg Asn Val Phe Arg Pro Gly Gly His Ser  
50 55 60

Tyr Gly Gly Gly Ala Thr Asn Ala Asn Ala Arg Ala Lys Gly Gly Thr  
65 70 75 80

Gly Gln Thr Gly Gly Leu Thr Gln Pro Lys Lys Asp Glu Pro Lys Lys  
85 90 95

Leu Pro Pro Arg Pro Gly Gly Pro Glu Pro Lys Pro Gly His Pro Pro  
100 105 110

Gln Thr Arg Gln Ala Thr Ala Arg Thr Val Thr Pro Lys Gly Gln Leu  
115 120 125

Pro Gly Gly Lys Ala Pro Pro Lys Ala Gly Ser Val Pro Ser Ser Phe  
130 135 140

Leu Leu Lys Lys Ala Arg Glu Pro Gly Pro Pro Arg Glu Pro Lys Glu  
145 150 155 160

Pro Phe Arg Pro Pro Pro Ile Thr Pro His Glu Tyr Met Leu Ser Leu  
165 170 175

Tyr Arg Thr Leu Ser Asp Ala Asp Arg Lys Gly Gly Asn Ser Ser Val  
180 185 190

Lys Leu Glu Ala Gly Leu Ala Asn Thr Ile Thr Ser Phe Ile Asp Lys  
195 200 205

Gly Gln Asp Asp Arg Gly Pro Val Val Arg Lys Gln Arg Tyr Val Phe  
210 215 220

Asp Ile Ser Ala Leu Glu Lys Asp Gly Leu Leu Gly Ala Glu Leu Arg  
225 230 235 240

Ile Leu Arg Lys Lys Pro Ser Asp Thr Ala Lys Pro Ala Ala Pro Gly  
245 250 255

Gly Gly Arg Ala Ala Gln Leu Lys Leu Ser Ser Cys Pro Ser Gly Arg  
260 265 270

Gln Pro Ala Ser Leu Leu Asp Val Arg Ser Val Pro Gly Leu Asp Gly  
275 280 285

Ser Gly Trp Glu Val Phe Asp Ile Trp Lys Leu Phe Arg Asn Phe Lys  
290 295 300

Asn Ser Ala Gln Leu Cys Leu Glu Leu Glu Ala Trp Glu Arg Gly Arg  
305 310 315 320

Ala Val Asp Leu Arg Gly Leu Gly Phe Asp Arg Ala Ala Arg Gln Val

325

330

335

His Glu Lys Ala Leu Phe Leu Val Phe Gly Arg Thr Lys Lys Arg Asp

340

345

350

Leu Phe Phe Asn Glu Ile Lys Ala Arg Ser Gly Gln Asp Asp Lys Thr

355

360

365

Val Tyr Glu Tyr Leu Phe Ser Gln Arg Arg Lys Arg Arg Ala Pro Leu

370

375

380

Ala Thr Arg Gln Gly Lys Arg Pro Ser Lys Asn Leu Lys Ala Arg Cys

385

390

395

400

Ser Arg Lys Ala Leu His Val Asn Phe Lys Asp Met Gly Trp Asp Asp

405

410

415

Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Phe His Cys Glu Gly Leu

420

425

430

Cys Glu Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala Val

435

440

445

Ile Gln Thr Leu Met Asn Ser Met Asp Pro Glu Ser Thr Pro Pro Thr

450

455

460

Cys Cys Val Pro Thr Arg Leu Ser Pro Ile Ser Ile Leu Phe Ile Asp

465

470

475

480

Ser Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val Glu

485

490

495

Ser Cys Gly Cys Arg

500

&lt;210&gt; 3



<211> 24

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(24)

<223> adapter primer

<400> 3

agaattcgca tgccatggc gacg

24

<210> 4

<211> 23

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(23)

<223> MP-52 internal primer

<400> 4

cttgagtacg aggcttcca ctg

23

<210> 5

<211> 24

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(24)

<223> adapter primer

<400> 5

attcgcatgc catggtcgac gaag

24

<210> 6

<211> 23

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(23)

<223> MP-52 internal primer

<400> 6

ggagcccacg aatcatgcag tca

23

<210> 7

<211> 23

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(23)

<223> MP-52 internal primer

<400> 7

acagcaggtg ggtggtgtgg act

23

<210> 8

<211> 44

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(44)

<223> primer composed of oligo dT and an adapter sequence

<400> 8

agaattcgca tgccatggc gacgaagctt tttttttt ttt

44

<210> 9

<211> 20

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(20)

<223> MP-52 internal primer

<400> 9

ccagcagccc atccttctcc

20

<210> 10

<211> 24

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(24)

<223> MP-52 internal primer

<400> 10

tccagggcac taatgtcaaa cacg

24

<210> 11

<211> 24

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(24)

<223> MP-52 internal primer

<400> 11

actaatgtca aacacgtacc tctg

24

<210> 12

<211> 10

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(10)

<223> adapter

<400> 12

agcggccgct

10

<210> 13

<211> 102

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(102)

<223> partial sequence of MP-52 starting with the first of the seven conserved cysteins

<400> 13

Cys Ser Arg Lys Ala Leu His Val Asn Phe Lys Asp Met Gly Trp Asp  
1 5 10 15

Asp Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Phe His Cys Glu Gly  
20 25 30

Leu Cys Glu Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala  
35 40 45

Val Ile Gln Thr Leu Met Asn Ser Met Asp Pro Glu Ser Thr Pro Pro  
50 55 60

Thr Cys Cys Val Pro Thr Arg Leu Ser Pro Ile Ser Ile Leu Phe Ile  
65 70 75 80



Asp Ser Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val  
85 90 95

Glu Ser Cys Gly Cys Arg  
100

<210> 14

<211> 101

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(101)

<223> portion of BMP 2 corresponding to MP 52

<400> 14

Cys Lys Arg His Pro Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn  
1 5 10 15

Asp Trp Ile Val Ala Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly  
20 25 30

Glu Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala

35 40 45

Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala

50 55 60

Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp

65 70 75 80

Glu Asn Glu Lys Val Val Leu Lys Asn Tyr Gln Asp Met Val Val Glu

85 90 95

Gly Cys Gly Cys Arg

100

<210> 15

<211> 101

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(101)

<223> portion of BMP 4 corresponding to MP 52

<400> 15

Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn

1            5            10            15

Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly

20            25            30

Asp Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala

35            40            45

Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile Pro Lys Ala

50            55            60

Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp

65            70            75            80

Glu Tyr Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu

85            90            95

Gly Cys Gly Cys Arg

100

<210> 16

<211> 102

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(102)

<223> portion of BMP 5 corresponding to MP 52

<400> 16

Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln  
1            5            10            15

Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Phe Tyr Cys Asp Gly  
          20            25            30

Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala  
          35            40            45

Ile Val Gln Thr Leu Val His Leu Met Phe Pro Asp His Val Pro Lys  
          50            55            60

Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65            70            75            80

Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
          85            90            95

Arg Ser Cys Gly Cys His  
          100

<210> 17

<211> 102

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(102)

<223> portion of BMP 6 corresponding to MP 52

<400> 17

Cys Arg Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln  
1 5 10 15

Asp Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly  
20 25 30

Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala  
35 40 45

Ile Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys  
50 55 60

Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65 70 75 80

Asp Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
85 90 95

Arg Ala Cys Gly Cys His

100

<210> 18

<211> 102

<212> PRT

<213> Homo sapiens

<220>

<221> DOMAIN

<222> (1)..(102)

<223> portion of BMP 7 corresponding to MP 52

<400> 18

Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln  
1            5            10            15

Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly  
20            25            30

Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala  
35            40            45

Ile Val Gln Thr Leu Val His Phe Ile Asn Pro Glu Thr Val Pro Lys  
50            55            60

Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65                70                75                80

Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
              85                90                95

Arg Ala Cys Gly Cys His  
              100

<210> 19

<211> 36

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(36)

<223> primer OD

<400> 19

atgaattccc atggacctgg gctggmakga mtggat

36

<210> 20

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of BMP 2 corresponding to primer OD

<400> 20

acgtggggtg gaatgactgg at

22

<210> 21

<211> 22

<212> DNA

<213> Homo sapiens

<220>



<221> misc\_feature

<222> (1)..(22)

<223> portion of BMP 3 corresponding to primer OD

<400> 21

atattggctg gagtgaatgg at

22

<210> 22

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of BMP 4 corresponding to primer OD

<400> 22

atgtgggctg gaatgactgg at

22

<210> 23

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of BMP 7 corresponding to primer OD

<400> 23

acctgggctg gcaggactgg at

22

<210> 24

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of TGF-beta-1 corresponding to primer OD

<400> 24

aggacctcgg ctggaagtgg at

22

<210> 25

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of TGF-beta-2 corresponding to primer OD

<400> 25

gggatctagg gtggaaatgg at

22

<210> 26

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of TGF-beta-3 corresponding to primer OD

<400> 26

aggatctggg ctggaagtgg gt

22

<210> 27

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of Inhibin alpha corresponding to primer OD

<400> 27

agctgggctg ggaacggtgg at

22

<210> 28

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of Inhibin beta-A corresponding to primer OD

<400> 28

acatcggctg gaatgactgg at

22

<210> 29

<211> 22

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(22)

<223> portion of Inhibin beta-B corresponding to primer OD

<400> 29

tcacggctg gaacgactgg at

22

<210> 30

<211> 29

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(29)

<223> Primer OID

<400> 30

atgaattcga gctgcgtsgg srcacagca

29

<210> 31

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of BMP 2 corresponding to primer OID

<400> 31

gagttctgtc gggacacagc a

21

<210> 32

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of BMP 3 corresponding to primer OID



<400> 32

catcttttct ggtacacagc a

21

<210> 33

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of BMP 4 corresponding to primer OID

<400> 33

cagttcagtg ggcacacaac a

21

<210> 34

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of BMP 7 corresponding to primer OID

<400> 34

gagctgcgtg ggcgcacagc a

21

<210> 35

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of TGF-beta-1 corresponding to primer OID

<400> 35

cagcgcctgc ggcacgcagc a

21

<210> 36

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of TGF-beta-2 corresponding to primer OID

<400> 36

taaatcttgg gacacgcagc a

21

<210> 37

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of TGF-beta-3 corresponding to primer OID

<400> 37

caggtcctgg ggcacgcagc a

21

<210> 38

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of Inhibin alpha corresponding to primer OID

<400> 38

ccctgggaga gcagcacagc a

21

<210> 39

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of Inhibin beta-A corresponding to primer OID

<400> 39

cagcttggtg ggcacacagc a

21

<210> 40

<211> 21

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)..(21)

<223> portion of Inhibin beta-B corresponding to primer OID

<400> 40

cagcttggtg ggaatgcagc a

21

<210> 41

<211> 10

<212> DNA

<213> Artificial

Colt  
E7

<220>

<221> misc\_feature

<222> (1)..(10)

<223> Adapter

<400> 41

agcggccgct

10

---